

VERITAS NetBackup™ 4.5 for EMC Fastrax

System Administrator's Guide

for Solaris

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About This Guide

This guide explains how to install, configure, and use the VERITAS NetBackup for EMC Fastrax product on Solaris platforms.

Audience

This guide is intended for the NetBackup system administrator and assumes a thorough working knowledge of both UNIX and NetBackup administration.

Organization

- ◆ The “Introduction” is an overview of the product’s capabilities.
- ◆ The “Installation” chapter explains how to install and de-install NetBackup for EMC Fastrax.
- ◆ The “Configuration” chapter explains how to configure storage devices and policies.
- ◆ The “Using NetBackup For EMC Fastrax” chapter explains how to back up and restore files.
- ◆ The “Troubleshooting” chapter helps in resolving problems. See also the *NetBackup Troubleshooting Guide*.
- ◆ Appendix A describes the `bpfastrax` command.



Related Manuals

- ◆ *NetBackup Release Notes for UNIX and Windows*

Describes supported platforms and provides operating notes not found in the manuals or in the online help.

- ◆ *NetBackup ServerFree Agent System Administrator's Guide for UNIX*

Explains how to install, configure, and use NetBackup ServerFree Agent.

- ◆ *NetBackup DataCenter System Administrator's Guide for UNIX*

Explains how to configure and manage NetBackup DataCenter on a UNIX platform.

- ◆ *NetBackup DataCenter Installation Guide for UNIX*

Explains how to install NetBackup DataCenter for UNIX.

- ◆ *NetBackup User's Guide for UNIX*

- ◆ Explains how to perform user-directed backups, restores, and archives on a UNIX NetBackup client.

- ◆ *NetBackup for Oracle Advanced ServerFree Agent System Administrator's Guide for Solaris and HP*

Explains how to install, configure, and use NetBackup for Oracle ServerFree Agent to back up and restore Oracle databases that are on a UNIX NetBackup client.

For this NetBackup Oracle product, you may also need the following manuals from Oracle Corporation:

Oracle Enterprise Manager Administrator's Guide

Oracle8i Backup and Recovery Guide

Oracle8i Server Administrator's Guide

Oracle8i Recovery Manager User's Guide and Reference

- ◆ *NetBackup DataCenter Media Manager System Administrator's Guide for UNIX*

Explains how to configure and manage the storage devices and media that UNIX NetBackup servers use for backups.

- ◆ *NetBackup Media Manager Device Configuration Guide*

Provides information about configuring storage devices on UNIX systems.

- ◆ *NetBackup Troubleshooting Guide for UNIX*

Explains NetBackup error codes.

Accessibility

NetBackup contains features that make the user interface easier to use by people who are visually impaired and by people who have limited dexterity. Accessibility features include:

- ◆ Support for assistive technologies such as screen readers and voice input (Windows servers only)
- ◆ Support for keyboard (mouseless) navigation using accelerator keys and mnemonic keys

For more information, see the NetBackup system administrator's guide.

Conventions

The following explains typographical and other conventions used in this guide.

Type Style

Typographic Conventions

Typeface	Usage
Bold fixed width	Input. For example, type <code>cd</code> to change directories.
Fixed width	Paths, commands, filenames, or output. For example: The default installation directory is <code>/opt/VRTSxx</code> .
<i>Italics</i>	Book titles, new terms, or used for emphasis. For example: <i>Do not</i> ignore cautions.
<i>Sans serif</i> (italics)	Placeholder text or variables. For example: Replace <i>filename</i> with the name of your file.
Serif (no italics)	Graphical user interface (GUI) objects, such as fields, menu choices, etc. For example: Enter your password in the Password field.



Notes and Cautions

Note This is a Note. Notes are used to call attention to information that makes using the product easier or helps in avoiding problems.

Caution This is a Caution. Cautions are used to warn about situations that could cause data loss.

Key Combinations

Some keyboard command sequences use two or more keys at the same time. For example, holding down the **Ctrl** key while pressing another key. Keyboard command sequences are indicated by connecting the keys with a plus sign. For example:

Press Ctrl+t

Command Usage

The following conventions are frequently used in the synopsis of command usage.
brackets []

The enclosed command line component is optional.

Vertical bar or pipe (|)

Separates optional arguments from which the user can choose. For example, when a command has the following format:

`command arg1 | arg2`

the user can use either the *arg1* or *arg2* variable.

Terms

The terms listed in the table below are used in the VERITAS NetBackup documentation to increase readability while maintaining technical accuracy.

Term	Definition
Microsoft Windows, Windows	<p>Terms used as nouns to describe a line of operating systems developed by Microsoft, Inc.</p> <p>A term used as an adjective to describe a specific product or noun. Some examples are: Windows 95, Windows 98, Windows NT, Windows 2000, Windows servers, Windows clients, Windows platforms, Windows hosts, and Windows GUI.</p> <p>Where a specific Windows product is identified, then only that particular product is valid with regards to the instance in which it is being used.</p> <p>For more information on the Windows operating systems that NetBackup supports, refer to the VERITAS support web site at http://www.support.veritas.com.</p>
Windows servers	A term that defines the Windows server platforms that NetBackup supports; those platforms are: Windows NT and Windows 2000.
Windows clients	A term that defines the Windows client platforms that NetBackup supports; those platforms are: Windows 95, 98, ME, NT, 2000, XP (for 32- and 64-bit versions), and LE.

Getting Help

For updated information about this product, including system requirements, supported platforms, supported peripherals, and a list of current patches available from Technical Support, visit our web site:

<http://www.support.veritas.com/>

VERITAS Customer Support has an extensive technical support structure that enables you to contact technical support teams that are trained to answer questions to specific products. You can contact Customer Support by sending an e-mail to support@veritas.com, or by finding a product-specific phone number from the VERITAS support web site. The following steps describe how to locate the proper phone number.



1. Open <http://www.support.veritas.com/> in your web browser.
2. Click **Contact Support**. The *Contacting Support Product List* page appears.
3. Select a product line and then a product from the lists that appear. The page will refresh with a list of technical support phone numbers that are specific to the product you just selected.

This chapter describes NetBackup for EMC Fastrax, and contains the following topics.

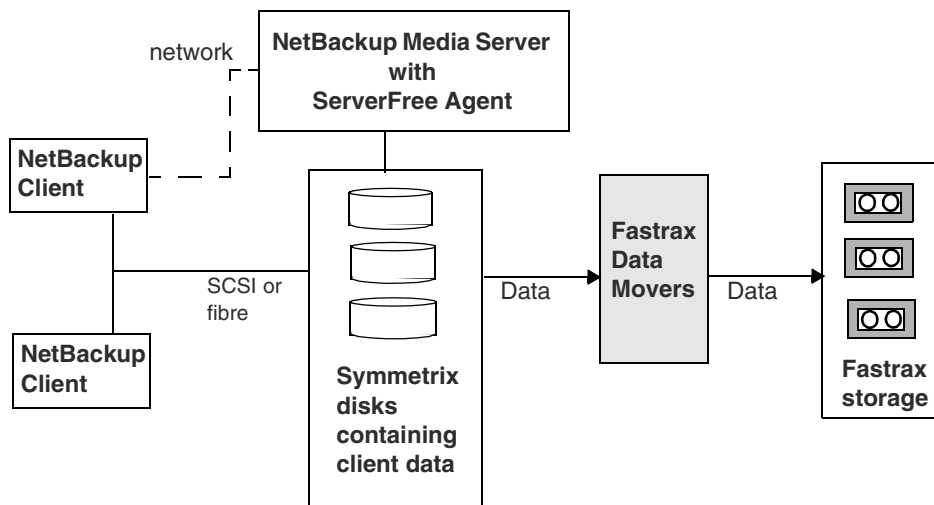
- ◆ Overview
- ◆ Terminology
- ◆ Features
- ◆ Requirements
- ◆ Restrictions



Overview

NetBackup for EMC Fastrax provides backup and restore of Symmetrix client data. The data is moved by an EMC Fastrax system which functions as a third-party copy device called a *data mover*. NetBackup coordinates backup and restore using the frozen image and offhost backup technology of NetBackup ServerFree Agent.

NetBackup for EMC Fastrax: Overview

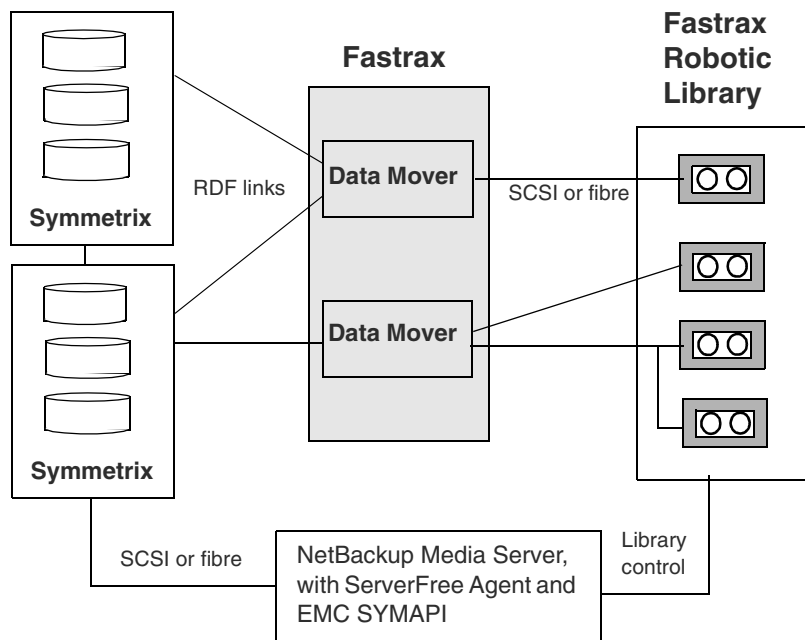


As shown above, NetBackup client data is maintained on EMC Symmetrix disk arrays. A NetBackup media server uses frozen image and offhost mapping techniques to allow the Fastrax to move the backup data to Fastrax-attached tape drives. This makes the Fastrax a very high speed third-party copy device. NetBackup sends a list of disk extents describing the data to be moved, and the Fastrax moves the data between the Symmetrix disk array and the tape drives.

A Closer Look

The tape drives can be directly attached to the Fastrax using SCSI connections, or attached through a bridge on fibre channel. To communicate with Fastrax, NetBackup uses the EMC Symmetrix API (SYMAPI) commands.

NetBackup for EMC Fastrax: More Detail



As shown above, the Fastrax can contain multiple data movers (up to four). Each mover can connect to one or two Symmetrix arrays by means of an EMC RDF link. Each mover has two SCSI channels for connections to multiple tape drives. The number of drives supported per channel depends on several factors (see your EMC systems engineer for details).

Note that the NetBackup media server has a direct connection to the robotic library. This allows NetBackup to control the mounting of volumes.

The media server connects to Symmetrix by means of SCSI or fibre channel. Although a media server can connect through Symmetrix to multiple Fastrax units, only one media server can have access to a given Fastrax. (The NetBackup Shared Storage Option is not supported in this release.)

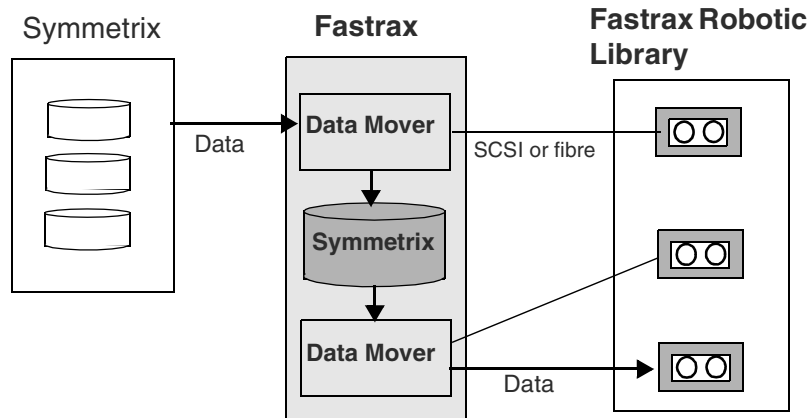
Note Two data movers cannot be connected to the same tape drive.



Backup Performance Is Optimized

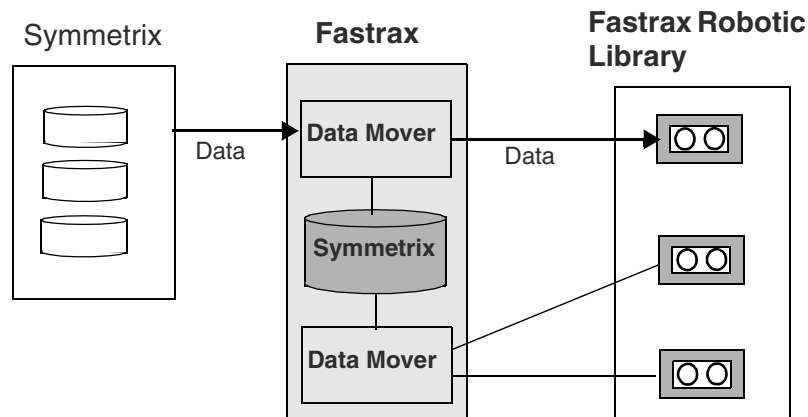
A Fastrax with multiple data movers can pass the backup data from one mover to another through a dedicated Symmetrix in the Fastrax, as shown below.

Passing Data Between Movers



Transferring data between movers, however, can reduce backup performance. A single data path, through one data mover directly to the tape drive, results in the best performance (see next figure).

Direct Route Is Faster



Note NetBackup automatically determines the best route through the Fastrax. Manually downing tape drives in order to achieve a particular data path is likely to reduce performance.

Frozen Image and Offhost Services Required

In order to back up Symmetrix client data and send the backup image to Fastrax storage, NetBackup must do the following:

- ◆ **Make a frozen image of the data**

This is done by the NetBackup “Core Frozen Image Services” option.

To use the EMC TimeFinder frozen image method, the “Extended Frozen Image Services” option is also required.

- ◆ **Convert the image for offhost backup**

This is done by the “Offhost and SAN Data Movement Services” option.

These products must be installed and licensed on your NetBackup servers and clients. For assistance, refer to the *NetBackup ServerFree Agent System Administrator's Guide*.



Terminology

This section introduces terms used with NetBackup for EMC Fastrax.

For frozen image, offhost backup, and SAN terminology, refer to the *NetBackup ServerFree Agent System Administrator's Guide*.

Fastrax

An EMC data movement platform for high-speed backup and restore. Fastrax operates as a third-party copy device that moves data between an EMC Symmetrix system and Fastrax-attached tape drives.

Data Mover

A Fastrax component (Pentium processor) that moves data between an EMC Symmetrix system and Fastrax-attached tape drives. Each mover has connectors for one or two Symmetrix systems, and also has two SCSI channels to which multiple tapes drives can be attached.

SYMAPI

The Symmetrix Application Programming Interface from EMC that allows NetBackup to communicate with the Symmetrix disk arrays, Fastrax, and the Fastrax-attached tape drives.

SYMCLI

The Symmetrix Command Line Interface from EMC that allows NetBackup to communicate with the Symmetrix disk arrays, Fastrax, and the Fastrax-attached tape drives.

Symmetrix

A line of EMC disk storage systems (disk arrays). In a NetBackup for EMC Fastrax configuration, the data to be backed up resides on a Symmetrix storage system. For a backup, the data is moved from the Symmetrix storage through a Fastrax unit to a Fastrax-attached tape drive.

Virtual Circuit (VC)

The connection, between a Symmetrix and a tape drive, through which the backup image flows during a backup.

Features

NetBackup for EMC Fastrax provides the following services and features.

- ◆ Backs up VERITAS VxFS 3.4 file systems and raw partitions.
- ◆ Performs an EMC version of third-party copy backup (Fastrax Copy Device).
- ◆ Supports NetBackup **Standard** and **Oracle** policy types.
- ◆ Supports the following frozen image methods: `nbu_snap`, `fsclone`, and `TimeFinder`. For details on these, refer to the *NetBackup ServerFree Agent System Administrator's Guide*.
- ◆ Supports individual file restores.
- ◆ Performs block-level restores.
- ◆ Supports multistreaming.
- ◆ A single NetBackup media server supports multiple Fastrax units.

Requirements

NetBackup for EMC Fastrax requires the following components:

- ◆ An EMC Fastrax data movement platform that has from one to four internal Fastrax servers (data movers).
- ◆ Symmetrix disk arrays with EMC RDF connections to the Fastrax.
- ◆ Tape drives with SCSI or fibre channel connections to the Fastrax. Tape drives must be able to provide their serial numbers to the Fastrax.
- ◆ A NetBackup DataCenter media server, with either SCSI or fibre channel connection to all the Symmetrix disk arrays that will be used by clients. The NetBackup media server must be running Solaris 2.6, 7, or 8, with NetBackup “Core Frozen Image Services” and “Offhost and SAN Data Movement Services” software installed.
- ◆ Clients running Solaris 2.6, 7, or 8, with NetBackup client software including “Core Frozen Image Services” and “Offhost and SAN Data Movement Services” software installed. Note that the `TimeFinder` frozen image method requires “Extended Frozen Image Services” software.
- ◆ For proxy copy, NetBackup Oracle clients must be at Oracle 8i or above. Please contact your VERITAS sales representative for information on other supported versions.
- ◆ SYMAPI version 4.2-154 or above must be installed on the NetBackup media server and clients, in `/usr/symcli/shlib`.



Note SYMAPI is not included on your NetBackup installation media; it must be obtained from EMC.

- ◆ All requirements listed in the *NetBackup ServerFree Agent System Administrator's Guide* also apply to NetBackup Fastrax.

Restrictions

For a complete list of supported peripherals, and for other NetBackup operational limitations, refer to the *NetBackup Release Notes* or to the VERITAS support web site at www.support.veritas.com. Please note the following restrictions for NetBackup for EMC Fastrax:

- ◆ Only one media server can have access to a given Fastrax unit. More than one Fastrax may be connected to a single media server.
- ◆ Backups and restores are limited to Fastrax devices only.
- ◆ Supports the VERITAS VxFS file system only (ufs file system is not supported).
- ◆ The tape used for a NetBackup Fastrax backup is not interchangeable with regular NetBackup tapes: it cannot be read by NetBackup or used for regular NetBackup backups. Conversely, a NetBackup tape cannot be used for a NetBackup Fastrax backup. (NetBackup automatically segregates NetBackup tapes from Fastrax tapes.)
- ◆ For a block-level restore, the client file system must be mounted but inactive. This means that no system reorganization (such as defragmenting a VxFS file system disk, or expanding or contracting space under the Volume Manager) should take place during the restore.
- ◆ Supports only TLD robotic libraries. Tape drives must be qualified by EMC as working with Fastrax systems; contact EMC for more information on the drive types supported by Fastrax. The drives must provide a serial number as part of their Mode Sense information, readable by Fastrax.
- ◆ Unserialized tape drives are not supported.
- ◆ NetBackup multiplexing is not supported.
- ◆ Volume Manager (VxVM) volumes that are either striped or concatenated across multiple Symmetrix arrays are not supported.
- ◆ Volume Manager (VxVM) mirrored volumes and RAID5 volumes are not supported. Also, the vxvm frozen image method is not supported.
- ◆ Image import and verify of Fastrax tapes can only be done from a Fastrax-attached tape device.
- ◆ Image duplication is not supported.

- ◆ Standalone drives are not supported.
- ◆ The same tape drive must be used for the entire backup if the backup image requires two or more tape volumes.
- ◆ NetBackup Shared Storage Option is not supported.
- ◆ FlashBackup policies are not supported (supports Standard and Oracle policies only). Note that NetBackup Fastrax in a Standard policy provides the same functionality as FlashBackup: high-speed raw partition backups, and individual file restores.
- ◆ All restrictions listed in the *NetBackup ServerFree Agent System Administrator's Guide* also apply to NetBackup Fastrax.





This chapter explains how to install NetBackup for EMC Fastrax software.

Software Prerequisites

NetBackup 4.5 DataCenter software and the following additional software packages must be installed on Solaris 2.6, 7, or 8 platforms (server and clients). Make sure to follow the instructions in the Installation chapter of the *NetBackup ServerFree Agent System Administrator's Guide*.

- ◆ “Core Frozen Image Services” option
- ◆ “Offhost and SAN Data Movement Services” option
- ◆ “Extended Frozen Image Services” option, only if you want to use the EMC TimeFinder frozen image method, described in the *NetBackup ServerFree Agent System Administrator's Guide*.
- ◆ SYMAPI version 4.2-154 and above must be installed on the NetBackup media server and clients.

Note SYMAPI is not included on your NetBackup installation media; it can be obtained from EMC and should be installed in `/usr/symcli/shlib`.

NetBackup for EMC Fastrax Installation

When NetBackup software is installed, the NetBackup for EMC Fastrax software is automatically installed. Since NetBackup for EMC Fastrax is a separately licensed feature, you need a license key to enable it. Check the license keys that were included with your software order to ensure that you have the NetBackup for EMC Fastrax key.



Enable Fastrax on All Servers

NetBackup for EMC Fastrax must be enabled by entering the Fastrax key on your NetBackup master and media servers.

1. Log in as root on the NetBackup master server.
2. Make sure a valid license key for NetBackup for EMC Fastrax has been installed. To do this, enter the following command to list and add keys:

```
/usr/openv/netbackup/bin/admincmd/get_license_key
```

Note No additional installation steps are needed. Your NetBackup for EMC Fastrax software was automatically installed when you installed NetBackup DataCenter server and clients. For NetBackup installation instructions, refer to the *NetBackup DataCenter Installation Guide for UNIX*.

Create a Link to the EMC Shared Libraries

EMC releases several different versions of its SYMAPI library (`libsymapi.so`), to support multi-threading, 32-bit and 64-bit machines, and so forth. The library name and install location vary, depending on your configuration.

When the SYMAPI library is being installed, the EMC package creates a link to the correct library file name, but in some cases this link may not point to the correct directory (`/usr/symcli`). This may happen if your installation has multiple packages, or if you install another version (such as multi-threaded, or 64-bit `symcli`). Without the proper symbolic link, NetBackup Fastrax backups will fail (NetBackup progress log will state “SYMINIT failed”).

As a result, you may need to create a `/usr/symcli` symbolic link to the SYMAPI shared libraries. For instance, NetBackup Fastrax must be able to find the following:

```
/usr/symcli/shlib/libsymapi.so  
/usr/symcli/shlib/libsymlvm.so
```

The default `symcli` location is the following:

```
lrwxrwxrwx  1 root      other          22 Dec  3 09:23 symcli ->  
/opt/emc/SYMCLI/V4.3.2
```

Note that this example is for version 4.3.2.

Uninstall NetBackup for EMC Fastrax

Although a special license key is required to use the NetBackup for EMC Fastrax product, the software is installed as part of NetBackup server software. There are no Fastrax files and directories that can be uninstalled without uninstalling all of NetBackup.

To uninstall NetBackup for EMC Fastrax and all of NetBackup, follow the instructions for uninstalling NetBackup DataCenter in the *NetBackup DataCenter Installation Guide for UNIX*.



This chapter explains how to configure NetBackup for EMC Fastrax. Note that ServerFree Agent must be configured in order to use NetBackup Fastrax.

The following topics are covered in this chapter:

- ◆ Prerequisites
- ◆ Configuring Fastrax Tape Devices
- ◆ Configuring a Policy for Fastrax
- ◆ Fastrax Tape Format and Fastrax Drives
- ◆ Hardware Configurations
- ◆ Rebuilding the Symmetrix (SYMAPI) Database
- ◆ Notes



Prerequisites

Before proceeding with this chapter, make sure the following have been completed.

- ◆ Your EMC devices (Symmetrix disk arrays, Fastrax system, and Fastrax-attached tape drives) must be correctly configured and functioning. This relates to EMC configuration, not to NetBackup (refer to your EMC documentation).
- ◆ NetBackup DataCenter and additional software packages (including ServerFree Agent) must be installed as explained in the “Installation” chapter.
- ◆ A license key for NetBackup for EMC Fastrax software must be entered.
- ◆ For frozen image backups, a frozen image method must be configured as described in the *NetBackup ServerFree Agent System Administrator's Guide*.
- ◆ Create a policy with a backup schedule, and specify the client and files to back up (file list). Be sure to specify the client type as Solaris. (If you use the Backup Policy Configuration wizard, see the “Backup Policy Configuration Wizard” section of the *NetBackup ServerFree Agent System Administrator's Guide*.)
- ◆ Create the following troubleshooting directories: `online_util`, `bpbkar`, `bptm`, and `symlogs` (use an access mode of 777).

Configuring Fastrax Tape Devices

Fastrax-attached tape devices must be configured for NetBackup. This section describes two ways to configure the drives: using the Device Configuration wizard, or using other components of the NetBackup Administration Console.

Using the Device Configuration Wizard

The Device Configuration wizard detects robots and any Fastrax-attached robotic tape drives, configures the drives if possible (explained below), and adds the robots to Fastrax-type storage units.

Note Standalone tape drives are not supported: the Fastrax-attached drives must be in a robotic library. Also, Fastrax-attached drives *that do not support serialization cannot be used*. However, if the drives support serialization but the robot does not, you may need to configure the drives manually (please refer to this and the following section).

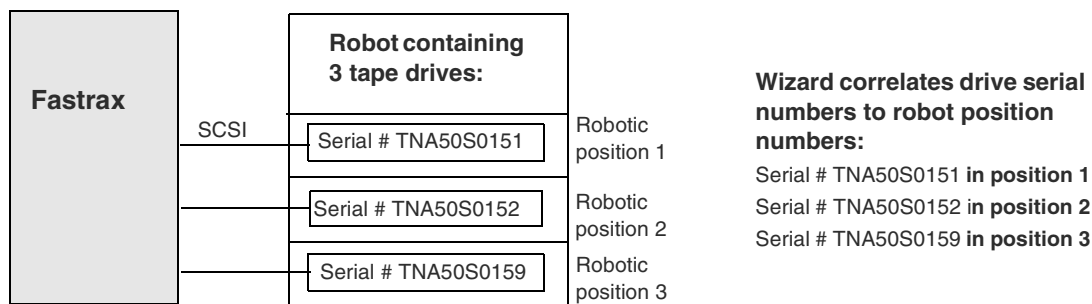
Note Drives cannot be shared between two or more hosts: the Shared Storage Option is not supported.

The NetBackup for EMC Fastrax software identifies attached robotic drives by means of drive serial numbers. It also needs to know which position the drive occupies in the robot. To allow NetBackup to work with Fastrax, each drive's serial number and its robotic position must be correlated (matched).

See the next diagram.



Matching Drive Serial Numbers to Robotic Positions



If the Device Configuration wizard obtains a drive's serial number from the robot, the wizard automatically matches that serial number with the drive's number (robotic position).

If the robot does not return a serial number for each of its drives (if the robot does not support drive serialization), the wizard will not be able to match the drives' serial numbers with their robotic position numbers. You must indicate which drive belongs in which robotic position, on the **Drag and Drop Configuration** display of the wizard.

▼ To run the Device Configuration wizard:

1. Start the NetBackup Administration Console by entering the following:

```
/usr/opensv/netbackup/bin/jnbSA &
```

2. Click **Configure Storage Devices** in the right pane.

Note The tape drives must already be attached to the Fastrax system and configured as EMC Fastrax devices. For assistance, refer to your EMC documentation.

3. While using the wizard, note the following:

- ◆ **Device Hosts** display: Place a check beside the NetBackup media servers (device hosts) that have robotic control of the Fastrax-attached tape drives.
- ◆ **Backup Devices** display: Review the devices found by the wizard, making sure the appropriate robots and Fastrax-attached drives are listed.

For each device in the list, note the following:

Serialized column:

- "Yes" means that the device supports serialization.

- “No” means the device does not support serialization. If the device is a tape drive, the drive cannot be used with the NetBackup for EMC Fastrax product. If the device is a robot, but its tape drives do support serialization, the drives may have to be manually configured into their correct robotic positions by means of the next display (**Drag and Drop Configuration**).

Limitations column: All Fastrax-attached drives will be shown with “Yes, see limitations.” Note that Fastrax does not support SCSI passthru inquiries; as a result, SCSI passthru commands cannot be used on Fastrax drives.

◆ **Drag and Drop Configuration** display.

- Drives listed under a **Robot**: These are correctly configured by the wizard. If all Fastrax-attached drives are shown under their respective robots, no further configuration is needed. (You may enable or disable the drives by placing a checkmark beside each.)
- Drives listed as **Standalone Drives**: These may be drives that the wizard could not configure. In some cases, the robot containing these drives did not return the drives’ serial numbers to the wizard. If the robot is listed in this display with empty drive icons beneath it, the drives belonging to that robot must be dragged up to the correct drive-position icon beneath the robot. For assistance, see “Arranging Drives in the Robot” on page 20.

Note Drives that are truly standalone (not physically residing in a robot) cannot be used with NetBackup for EMC Fastrax.

- **Properties** button: To view the properties of a drive, click on the drive and click the **Properties** button.

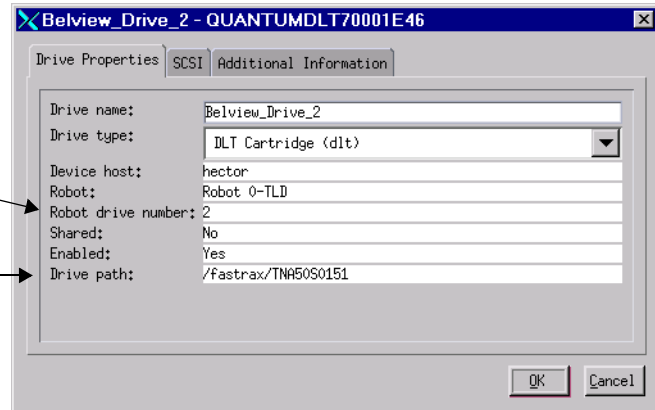
The **Drive Properties** tab for a Fastrax tape drive should list the **Drive path** as `/fastrax/serial_number`, where *serial_number* is the actual serial number of the tape drive. For example, `/fastrax/TNA50S0151`. (See the next diagram.)



If the wizard has correlated the drive's serial number to the robotic drive-position number, the drive number appears in the **Robot drive number** field.

If the wizard has configured the drive, the robot drive number is shown here.

Drive path must be /fastrax followed by the serial number.



If the wizard could not relate the serial number to the robotic drive-position number, the **Robot drive number** field is empty. You must determine this number (see “Arranging Drives in the Robot”).

- ◆ **Configure Storage Units:** The wizard will automatically create a storage unit of type **Fastrax**. Note that tape drives attached to a Fastrax must be included in a Fastrax-type storage unit.

For more control of storage units, refer to “Storage Units” and “Storage Unit Groups” later in this chapter.

Arranging Drives in the Robot

This section explains how to manually arrange Fastrax-attached drives in the Device Configuration wizard's **Drag and Drop Configuration** display. This may be necessary when the robot containing the drives does not support drive serialization.

1. Ensure that any non-Fastrax-attached drives in the robot(s) are fully configured. If all non-Fastrax drives are configured, only the Fastrax drives need to be loaded and scanned, as follows.
2. Use the `robtest` utility to empty all Fastrax-attached tape drives.
 - a. Start `robtest` as follows:


```
/usr/opensv/volmgr/bin/robtest
```
 - b. From the Robot Selection screen, select the appropriate robot.

- c. Determine which Fastrax-attached drives contain media by entering the following:

```
s d
```

- d. Empty any drives that contain media. For example, if drive number 2 contains media, you could enter the following to move the media to slot 5:

```
m d2 s5
```

If this command fails, use the robot's own maintenance utility to empty the drive.

3. Use `robtest` to insert a tape into a particular drive for which a serial number is needed. For example:

```
m s2 d2
```

The above example inserts a tape into the tape drive that occupies robotic drive position 2. **Make a note of the drive position (for instance, drive position 2): that number will be needed to finish the configuration at step 5.**

Note If you load a drive that is not yet defined and is not attached to the Fastrax, there will be problems unloading the drive (because no SCSI path has been defined). You must either define the drive or use the robot's maintenance utility to unload it.

4. Use the `scan` command in `robtest` to display the serial number of the drive whose drive number was specified in the previous step.

Note Make sure that the drives connected to the Fastrax you are about to scan are not in use. If a backup or restore operation is in progress, that operation might fail when the scan command attempts to access the drive.

```
scan
```

The scan command returns the serial number of the first drive it encounters that has a tape inserted. For this reason, it is important to have emptied all drives at step 2.

Example output:

```
Scanning Fastrax for mounted tape, could take several minutes,
please wait...
Drive /fastrax/TNA50S0151 found mounted.
```

5. In the Device Configuration wizard's **Drag and Drop Configuration** display, you can configure the correct position for the drive scanned at step 4 by dragging the drive to the correct position beneath its **Robot** line.



To drag the drive to its proper robotic position:

- a. Highlight a drive listed as **Standalone**, then click the **Properties** button.
- b. Verify that the serial number of the drive is the same as that returned by the `scan` command at step 4.
- c. Click **OK**.
- d. Drag the drive to the correct position beneath its robot. The drive number used in step 3 indicates the robotic position where the drive should be dropped (first position beneath the robot, or second position, and so forth).
- e. Click **Next** and finish the wizard.

Using Other Utilities in the Administration Console

Tape Drives

As explained in the previous sections, the Device Configuration wizard can be used to configure Fastrax-attached tape drives. You can also configure a tape drive without the wizard, as follows.

▼ **To manually add a Fastrax tape drive:**

1. Start the NetBackup Administration Console by entering the following:

```
/usr/opensv/netbackup/bin/jnbSA &
```
2. Expand **Devices** in the left pane, and click on **Robots**.
Currently defined devices are displayed in the right pane.

3. Right-click in the **All Drives** pane, and select **New Drive** from the pop-up menu.

The screenshot shows the 'Add a New Drive' dialog box with the following fields and annotations:

- Media Manager host:** hector
- Device host:** hector (dropdown menu)
- Host type:** Solaris
- Drive information:**
 - Drive name:** fastrax-test1 (Annotation: Specify a Fastrax drive name.)
 - Drive type:** DLT Cartridge (dlt) (Annotation: Select a drive type.)
 - No rewind device:** /fastrax/JP74681097 (Annotation: Specify the Fastrax drive path and serial number.)
 - Cleaning frequency (in hours):** 0
 - Drive status:** UP (radio button selected), DOWN (radio button)
- ☒ **Drive is in a robotic library.** (Annotation: Place check mark here (standalone drives not supported).)
- Robot drive information:**
 - Robotic library:** TLD(0) - hector (dropdown menu)
 - Robot drive number:** 1 (dropdown menu) (Annotation: Specify the drive's number (robotic position).)

4. Fill in as indicated above. Note the following.

- The Fastrax drive path and serial number are specified in the **No rewind device** field. Note that the path must be as follows:

/fastrax/serial_number

where *serial_number* is the serial number of the tape drive.

- **Drive type:** See the *NetBackup Release Notes* for a list of supported drive types.
- Standalone drives are not supported in this release. You must check **Drive is in a robotic library** and specify the robotic slot (drive number) of this tape drive.
- **Robotic library:** All TLD robotic libraries currently supported by NetBackup are supported by Fastrax.



Storage Units

NetBackup for EMC Fastrax requires that Fastrax-attached tape drives be included in a Fastrax-type storage unit. No other type of storage unit can be used.

The Device Configuration wizard can create Fastrax storage units. For more detailed control, use the **Storage Unit** displays in the NetBackup Administration Console, as follows. (For more information on storage units, refer to the *NetBackup DataCenter System Administrator's Guide*.)

▼ To create or change a Fastrax storage unit:

1. Start the NetBackup Administration Console by entering the following:

```
/usr/opensv/netbackup/bin/jnbSA &
```

2. Right-click on **Storage Units** in the left pane, and select **New** from the pop-up (or right-click on an existing storage unit in the right pane and select **Change**).

The Add New Storage Unit display appears.

Enter a storage unit name. →

Specify **Fastrax** as the type. →

Select the NetBackup media server. →

Add New Storage Unit

Master server: hector

Storage unit name: Fastrax-unit1

Storage unit type: Fastrax ☐ On demand only

Device Properties

Media server: hector ...

Robot type: TLD - Tape Library DLT Robot number: 0

Drive density: dlt - DLT Cartridge

Limits

Reset to Default

OK Cancel Help

3. Fill in as indicated above. Note the following.

- For **Robot type** and **Drive density**: All TLD robotic libraries and related drive densities currently supported by NetBackup (provided they are qualified by EMC) are supported by NetBackup for EMC Fastrax.

Storage Unit Groups

NetBackup for EMC Fastrax requires that tape drives be included in a Fastrax-type storage unit. Fastrax storage units can be arranged together in groups.

Note Storage unit groups must consist of Fastrax-type storage units only.

▼ To create a storage unit group

1. Start the NetBackup Administration Console by entering the following:

```
/usr/opensv/netbackup/bin/jnbSA &
```

2. Expand **Storage Units** in the left pane, right-click on **Storage Unit Groups**, and select **New** from the pop-up.

For detailed information on storage unit groups, refer to the *NetBackup DataCenter System Administrator's Guide*.



Configuring a Policy for Fastrax

Backups using the NetBackup Fastrax feature require a policy that specifies the “Fastrax Copy Device” method. The following procedure explains how to set the Fastrax Copy Device method and other policy attributes.

The Fastrax Copy Device method is not required for incremental backups (see “Non-Fastrax Incremental Backups” on page 28).

Certain policy attributes are not supported in conjunction with the Fastrax Copy Device method. The unsupported attributes are greyed out on the policy display.

1. Start the NetBackup Administration Console by entering the following:

```
/usr/opensv/netbackup/bin/jnbSA &
```

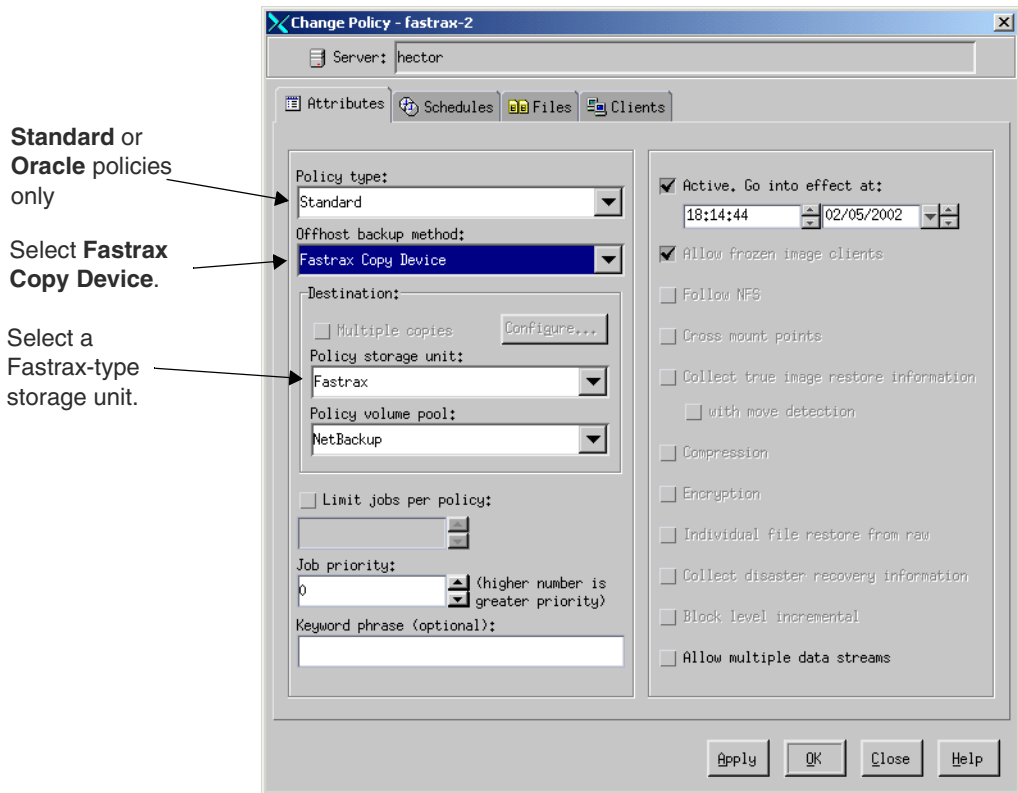
2. Click on **Policies** in the left pane.

The policies are displayed in the right pane.

3. Double click on a policy.

Only Standard and Oracle policies are supported.

The Change Policy dialog appears, showing the **Attributes** tab.



4. In the **Offhost backup method** pull-down menu, select **Fastrax Copy Device**. Backups using NetBackup for EMC Fastrax require this method.
5. Specify a Fastrax-type storage unit in the **Policy storage unit** pull-down menu. Do not select **Any_available**. The storage unit must contain Fastrax-attached tape drives. See “Storage Units” earlier in this chapter.

For tape devices that support serialization, the Device Configuration wizard can create a Fastrax storage unit for you.

To avoid specifying a particular storage unit, you can create a group of Fastrax storage units. Storage unit groups are described in the *NetBackup Media Manager System Administrator's Guide*.

6. Specify a policy volume pool.



Recommended (not required): Specify a Fastrax volume pool in the **Policy volume pool** menu. If a volume pool for Fastrax has not been created, please read the topic “Fastrax Tape Format and Fastrax Drives” on page 30.

7. To save these settings, click **Apply**.
8. If not already done, click the **Schedules** tab to define appropriate schedule(s) for the policy.

To define a schedule for non-Fastrax backups, refer to “Non-Fastrax Incremental Backups.”
9. If not already done, click the **Files** tab to specify the files to be backed up (this defines the policy file list).

Options for the policy schedule and file list are described in the *NetBackup DataCenter System Administrator’s Guide*. These are standard NetBackup features, not new in the 4.5 release.
10. **NOTE!** You must configure a frozen image method (you can use the **Clients** tab). See “Configuring a Frozen Image Method” in the *NetBackup ServerFree Agent System Administrator’s Guide*.

Non-Fastrax Incremental Backups

It may be advantageous to reserve the Fastrax units for larger backup jobs, scheduling smaller incremental backups for non-Fastrax processing. This can be done by creating an incremental schedule for the Fastrax policy and specifying a non-Fastrax storage unit, as follows.

1. Create a policy for Fastrax backups as described in the previous section, or open an existing Fastrax-backup policy.
2. Change the following:
 - Change **Offhost backup method** to **Local Host**
 - Change **Policy storage unit** to a non-Fastrax unit.
 - Re-specify a **Policy volume pool**.
3. On the Schedules tab for the same policy, click **New** and specify a name for an incremental schedule.
4. For **Type of backup**, select either **Differential** or **Cumulative**.

5. Place a check beside **Override policy storage unit** and select a Media Manager or disk type storage unit. Do not select an NDMP type.

Note It is important to have temporarily set the offhost backup method to **Local Host** and the policy storage unit to non-Fastrax before creating an incremental schedule. If not, a message states that the storage unit cannot be used with the Fastrax Copy Device method. In that case, return to the Attributes tab and repeat at step 2.

6. Configure the rest of the schedule as required.
7. On the Attributes tab, change the following:
 - Reset **Offhost backup method** to **Fastrax Copy Device**.
 - Reset **Policy storage unit** to the Fastrax type storage unit.
 - Reset **Policy volume pool** to that originally specified for the Fastrax policy (if different).



Fastrax Tape Format and Fastrax Drives

Although NetBackup controls the mounting of volumes directly, NetBackup does not control the format and order of the data written to a Fastrax tape. The tape is controlled by Fastrax. A tape that contains “native” NetBackup data formatted by NetBackup cannot be used for a Fastrax backup, and vice versa. For this reason, NetBackup checks the tape’s format before selecting a tape for a Fastrax backup.

You must be aware of the tape format, however, when performing either of these operations:

- ◆ Generating a report on robotic media: NetBackup cannot distinguish between native NetBackup tapes and Fastrax tapes when running a report.
- ◆ Importing/verifying backup images: A native NetBackup image cannot be imported through a Fastrax system, and a Fastrax backup image cannot be imported without a Fastrax unit and NetBackup for EMC Fastrax software.

Note A solution in both cases is to create separate tape *volume pools*: one pool for ordinary or native NetBackup tapes, another pool for Fastrax tapes. For help creating volume pools, refer to the *NetBackup Media Manager System Administrator’s Guide for UNIX*.

Note also:

- ◆ Native NetBackup tape drives (drives that have not been configured as Fastrax devices) cannot be used for Fastrax backups or restores.
- ◆ Conversely, Fastrax-attached tape drives cannot be used for native NetBackup backups or restores.

Relabeling Tapes Manually

Tapes with headers larger than 8192 bytes have to be manually relabeled before they can be used with NetBackup for EMC Fastrax. To relabel such tapes, use the `bplabel` command with the `format` option. Note that the tape drive must be directly attached to a NetBackup media server.

As is normally true of `bptm`, it is only necessary to label media that were either used for NetBackup database backup or for which an overwrite cannot be done.

Spanned Volumes

If a single backup image is too large for the assigned volume, NetBackup unmounts that volume when it is full and mounts a new volume in the same drive to complete the backup. The same drive must be used for the entire image, one volume at a time.

Hardware Configurations

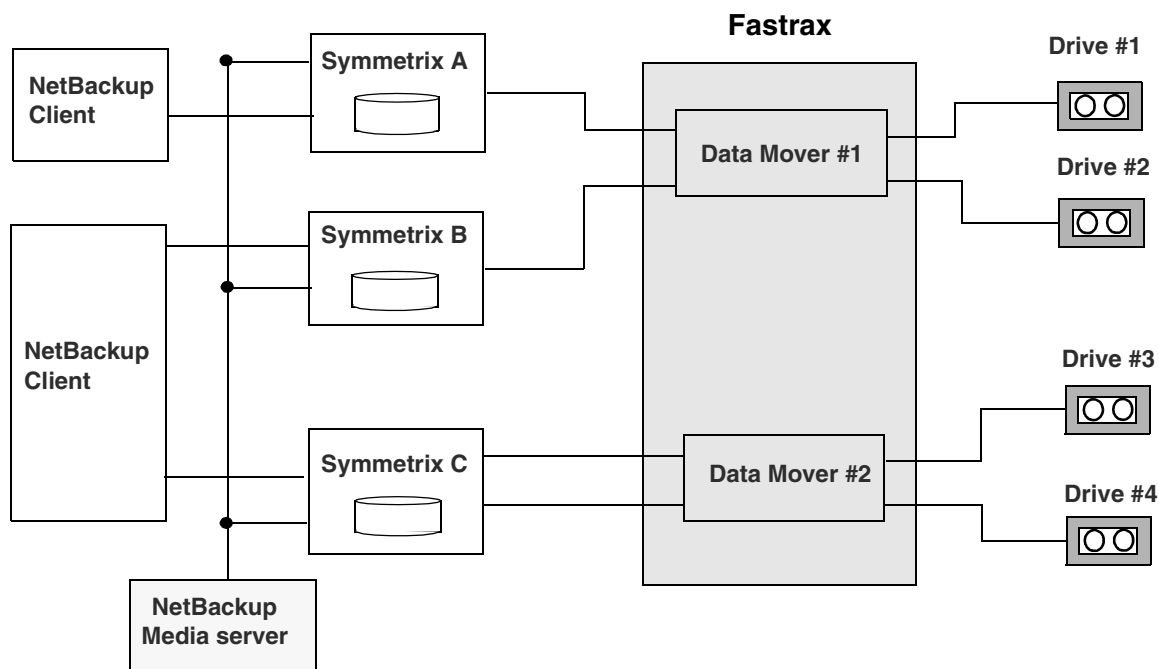
Note the following:

- ◆ Use of the NetBackup Shared Storage Option (SSO) to share Fastrax-attached tape drives is not supported.
- ◆ Sharing Fastrax tape drives between multiple media servers is not supported.

Supported Configurations

The following diagrams show supported configurations.

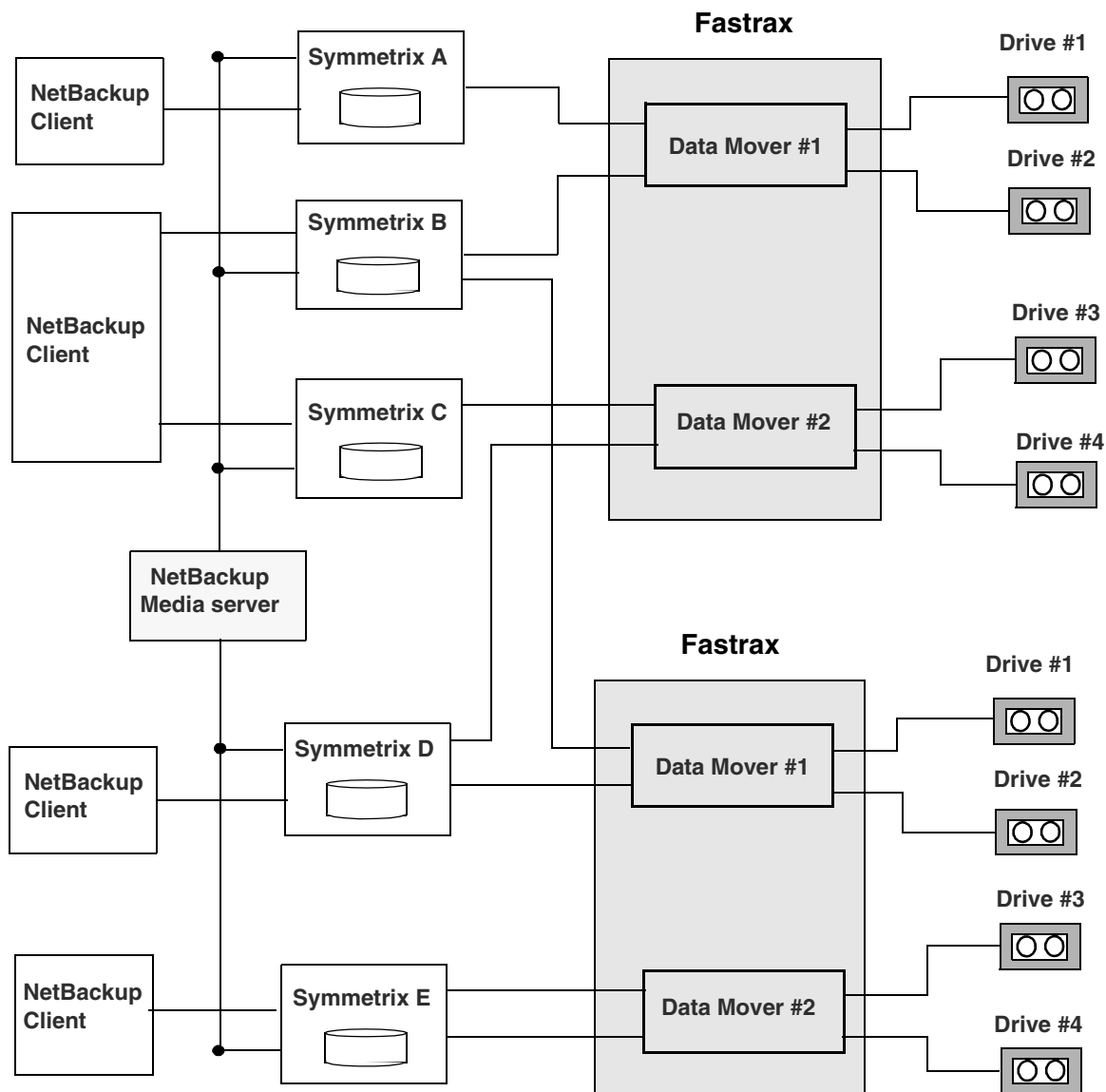
Single Fastrax, Single NetBackup Media Server



In the above example, one NetBackup media server has access to one Fastrax system. A second media server, with access to the same Fastrax, is not allowed.



Multiple Fastrax, Single NetBackup Media Server



As shown above, one NetBackup media server can access multiple Fastrax systems. A second media server, with access to either of the Fastrax systems, is not allowed.

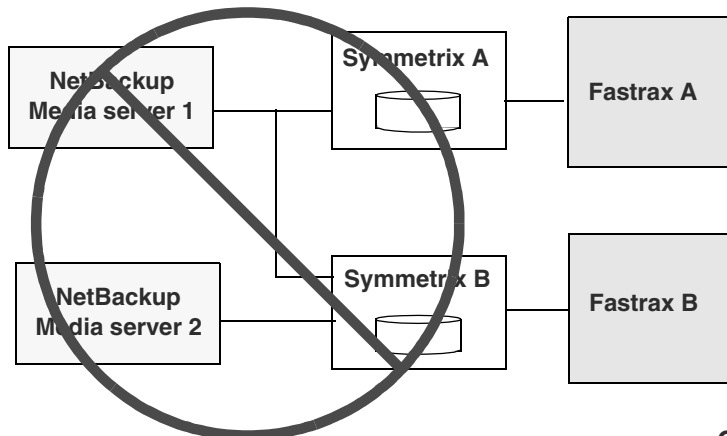
Also note: each Symmetrix can connect to multiple data movers, even if the data movers are not in the same Fastrax.

Unsupported Configurations

The following diagrams show unsupported configurations.

Two NetBackup Media Servers Access Same Fastrax: **NOT SUPPORTED!**

Unsupported Configuration

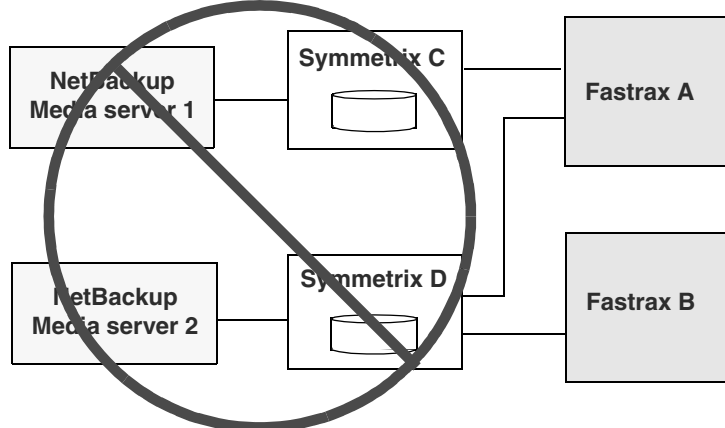


NetBackup Media Servers 1 and 2 have access to Fastrax B.

THIS CONFIGURATION IS NOT SUPPORTED!

Configurations such as these may have UNPREDICTABLE RESULTS.

Unsupported Configuration

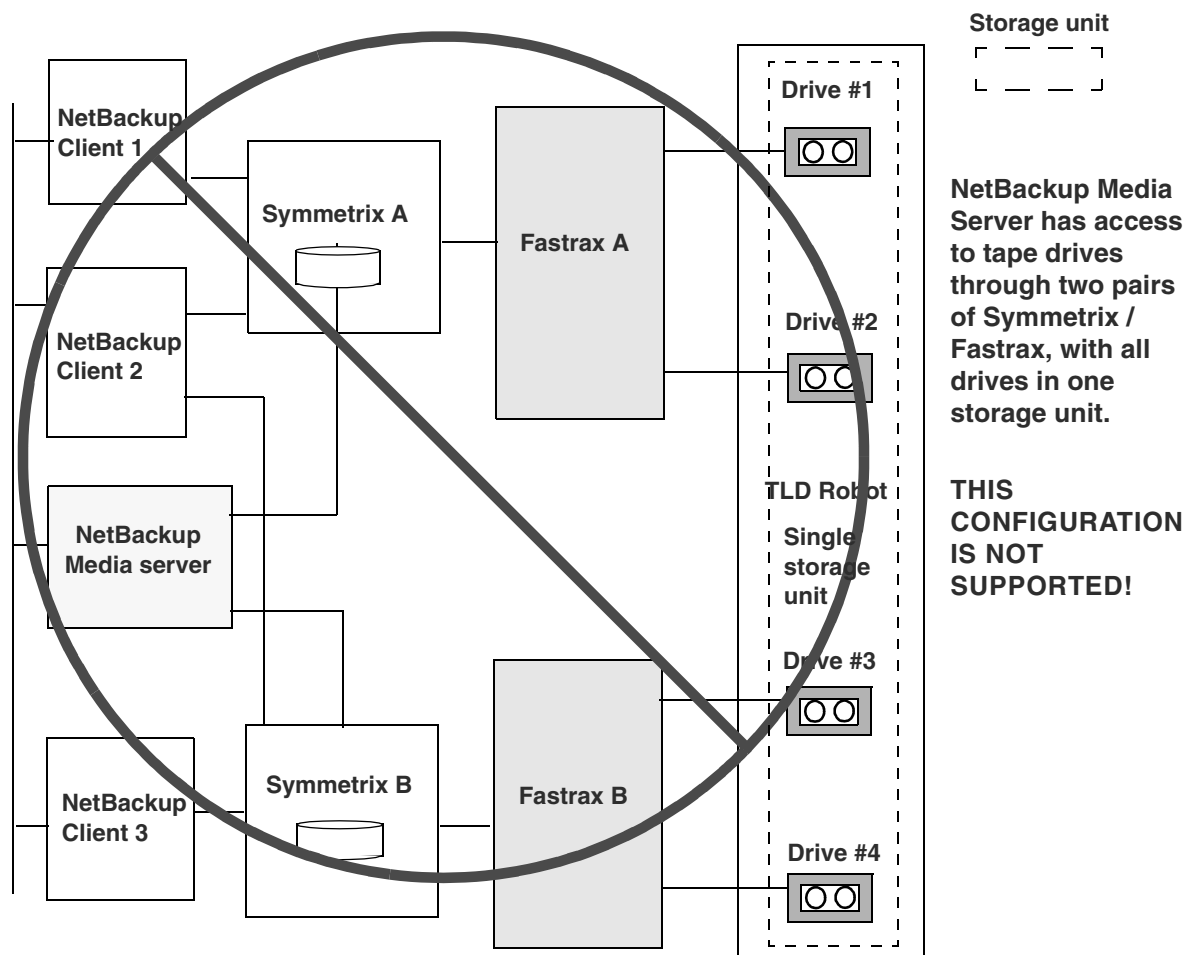


NetBackup Media Servers 1 and 2 have access to Fastrax A.

THIS CONFIGURATION IS NOT SUPPORTED!

As shown above, two NetBackup media servers should not have access to the same Fastrax. This may lead to unpredictable results.



Multiple Symmetrix-Fastrax Systems, One Storage Unit: **NOT SUPPORTED**

The above diagram illustrates a configuration that is not supported by the Fastrax unit. There are two Symmetrix systems, each connected to a different Fastrax. The Fastrax-attached tape drives are all in the same robot and storage unit. There is a single media server connected to both Symmetrix systems that controls both Fastrax.

In this configuration, the NetBackup scheduler cannot get an accurate count of the drives available for each Fastrax. Four drives are reported as available even though only two are available for each Fastrax. For example, if three backup jobs were started for data stored on Symmetrix A, the first two jobs could be sent to tape drives 1 and 2. For the third job

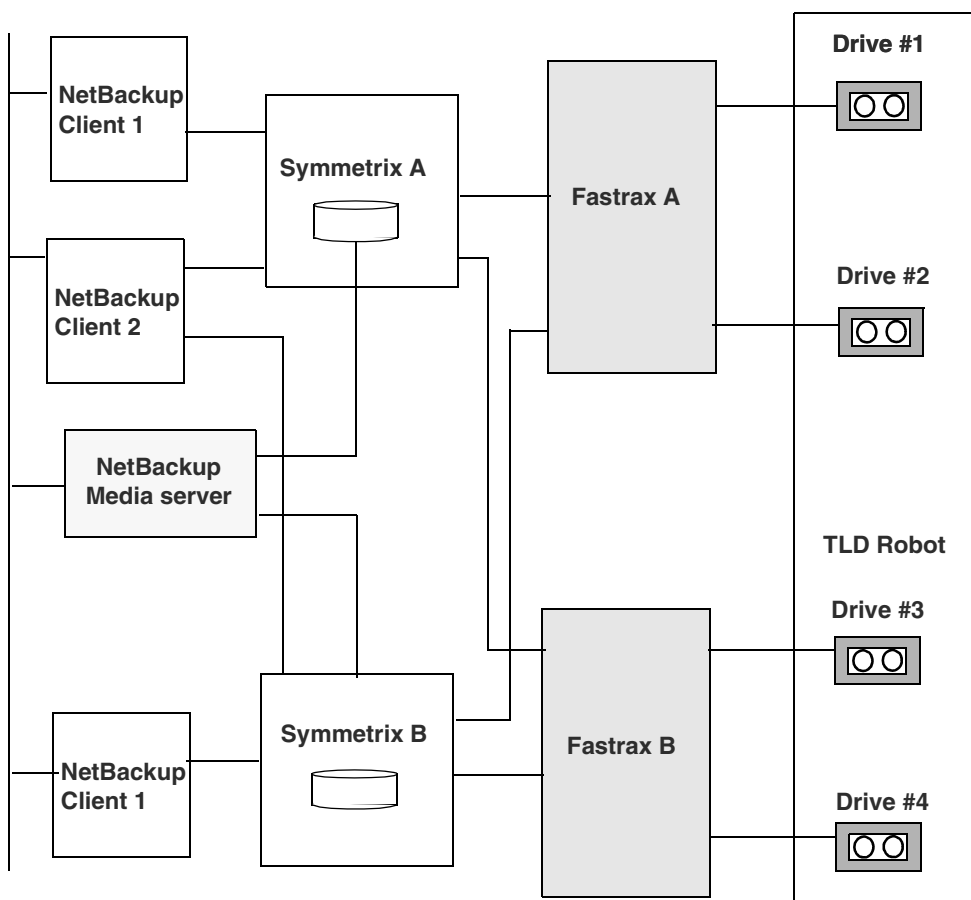
there would be no drive available, because Symmetrix A cannot access drives 3 or 4. The media server can see all four drives, but a Fastrax can access only the drives directly connected to that Fastrax. As a result, the third job would terminate with an error.

Alternative Configurations

Regarding the last diagram in the previous section (“Multiple Symmetrix-Fastrax Systems, One Storage Unit: NOT SUPPORTED”), there are two supported configurations that can be used as alternatives.

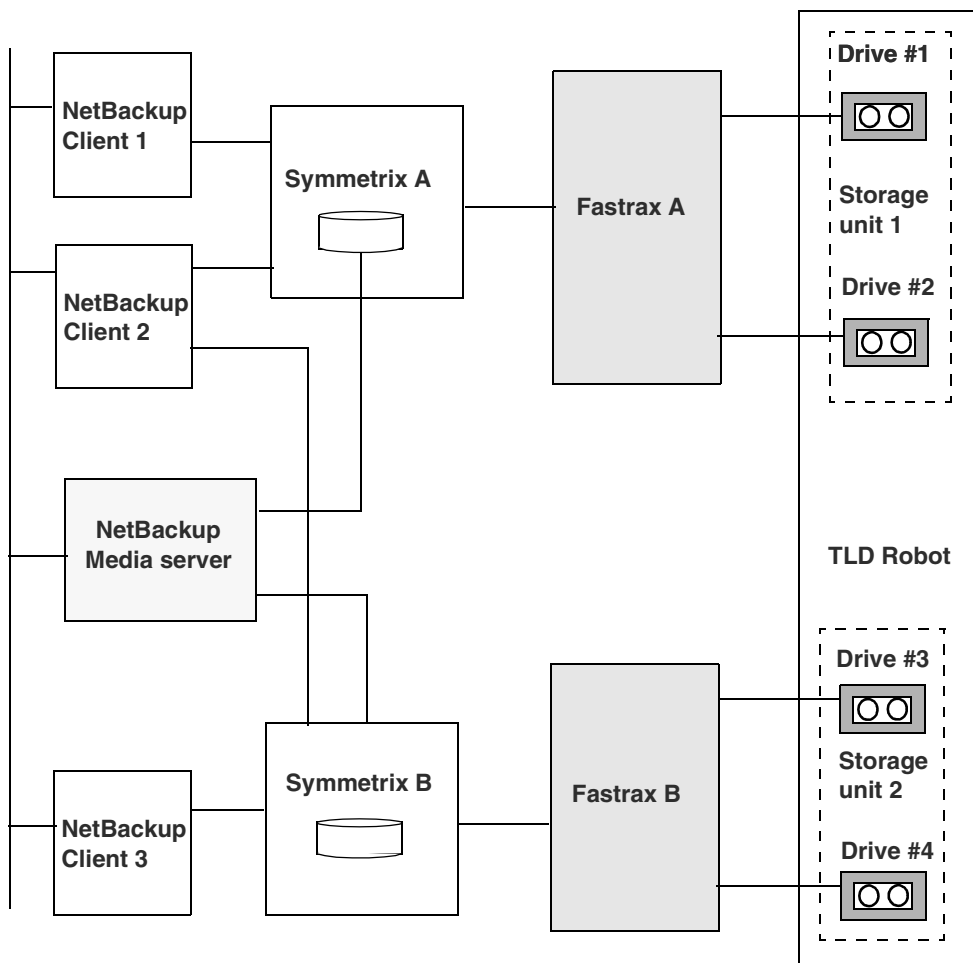
The least complex is to have both Symmetrix systems connected to both Fastrax systems: in other words, both Symmetrix would have access to all four drives (see diagram).

Multiple Symmetrix Systems with Multiple Fastrax Connections



Another alternative is to place the tape drives in two different storage units (see figure). Drives 1 and 2, connected to Fastrax A, are in storage unit 1, and drives 3 and 4, connected to Fastrax B, are in storage unit 2.

Multiple Symmetrix-Fastrax Systems, Two Storage Units



Rebuilding the Symmetrix (SYMAPI) Database

There is a SYMAPI database that contains configuration information about the Symmetrix and Fastrax units on the system. Whenever a change is made to the Symmetrix array (such as by EMC field personnel), the SYMAPI database on each affected NetBackup server and client must be rebuilt to reflect those changes. For a description of the SYMAPI database, refer to your EMC documentation.

Caution Do not perform this procedure while backups or restores are in progress. Otherwise, the backup or restore may fail.

▼ To rebuild the SYMAPI database on a NetBackup server

1. Stop the ltid daemon by entering the following command:

```
/usr/opensv/volmgr/bin/stopltd
```

2. Restart ltid by entering the following command:

```
/usr/opensv/volmgr/bin/ltid
```

▼ To rebuild the SYMAPI database on a NetBackup client

1. Enter the following on the NetBackup client:

```
/usr/opensv/netbackup/bin/bpfastrax
```

Note These operations update the database used by NetBackup. Symmetrix databases used by other applications need to be updated also.

The following menu appears:

```
bpfastrax: Access to Fastrax utilities
Select one:
    1) Rebuild the SYM data base.
    2) Close Drive's WC.
    3) Exit program

-> Which one: █
```

2. Select item 1.

The current database is deleted and a new one is built. The default location for this database is the following:



```
/usr/opensv/netbackup/db/symdb/symapi_db.bin
```

Note If the Symmetrix array is changed but the SYMAPI database is not rebuilt, backups may fail.

Notes

Fastrax Tape Drives

Tape drives must be configured as Fastrax devices before they are configured for NetBackup. Contact EMC for information on the drive types supported by Fastrax. See the “Requirements” and “Restrictions” sections in the Introduction for related hardware information.

Fastrax Movers and Drives: The Best Combination

For a Fastrax that contains multiple data movers, NetBackup automatically selects the best data mover and tape drive combination. There is no need to force the use of a particular drive by downing other drives (see diagrams under “Backup Performance Is Optimized” in the Introduction).

Images that Span Tape Volumes

If a single backup image is too large for the assigned volume, NetBackup unmounts that volume when it is full and mounts a new volume in the same drive to complete the backup. The same drive is used for the entire image, one volume at a time.

To prevent the drive from being assigned to a different backup job before the second volume is mounted, a hold is placed on the drive until the second volume is mounted and the backup continues. The hold lasts for 20 minutes.

Using NetBackup For EMC Fastrax

4

The following topics are covered in this chapter:

- ◆ Performing a Backup
- ◆ Performing a Restore



Performing a Backup

Automatic Backup

The most convenient way to back up client data is to configure a Standard or Oracle policy and then set up schedules for automatic, unattended backups. To use NetBackup for EMC Fastrax, you must configure a frozen image method and the Fastrax Copy Device offhost backup method as described in the “Configuration” chapter. To add new schedules or change existing schedules for automatic backups, follow the guidelines in the *NetBackup DataCenter System Administrator’s Guide for UNIX*.

Manual Backup

The administrator can use the NetBackup Administration Console on the master server to execute a backup for a Standard or Oracle policy. To use NetBackup for EMC Fastrax, you must configure a frozen image method and the Fastrax Copy Device offhost backup method as described in the “Configuration” chapter.

See the *NetBackup DataCenter System Administrator’s Guide for UNIX* for instructions on making manual backups.

User-Directed Backup and Archive

From a NetBackup 4.5 client, the user can execute a backup for a Standard or Oracle policy. The NetBackup administrator must configure a frozen image method and the Fastrax Copy Device offhost backup method as described in the “Configuration” chapter.

See the *NetBackup User’s Guide for UNIX* for instructions on making user-directed backups and archives.

Performing a Restore

Standard and Oracle Policies

You can use the NetBackup Administration Console on the client to restore a file system, raw partition, or volume in a Standard or Oracle policy. See the *NetBackup User's Guide for UNIX* for instructions.

Important Notes

Client data that was backed up through a Fastrax must be restored through a Fastrax

To restore data from a Fastrax tape, the tape must be in a Fastrax-attached drive.

Do not resize VxVM volumes, defragment VxFS file systems, or rebuild the SYMAPI database

Because restores made by NetBackup Fastrax operate at the block-level, the following operations **MUST NOT BE CONDUCTED DURING A RESTORE**:

- ◆ Resizing (shrinking/growing) or reorganizing VxVM volumes that are accessed by the restore.
- ◆ Reorganizing a VxFS file system or defragmenting a VxFS file system disk that is accessed by the restore.

Caution Performing any of these operations during a restore could result in inconsistencies in the file system, in VxVM volumes, or in data used by other applications. Restored (or other) data may be lost!

Avoid Accessing Files That Are Being Restored

During a block-level restore, the permissions of the files being restored are set to 0 until the files are fully restored. This is to prevent reading or writing to a file that may not be fully restored.

Note that accounts with root permissions can read or write a partially restored file, even if the file permissions are set to 0. Administrators should prevent accounts with root permissions from accessing a file that is being restored. If an attempt is made to write to files that are being restored before the restore is complete, errors may be introduced into the restored files and the restore should be performed again.





This chapter covers the following topics.

- ◆ Gathering Information and Checking Logs
- ◆ NetBackup for EMC Fastrax Errors
- ◆ Backup Process Overview
- ◆ Restore Process Overview

Note For explanations of NetBackup status codes, refer to “NetBackup Status Codes and Messages” in the *NetBackup Troubleshooting Guide*.

Note For detailed information on the correct use of frozen images and offhost backup, refer to the *NetBackup ServerFree Agent System Administrator’s Guide*.



Gathering Information and Checking Logs

You can resolve many problems on your own by setting up the appropriate logs, reproducing the problem, and then checking the logs. For an in-depth description of NetBackup logs, refer to Chapter 3 of the *NetBackup Troubleshooting Guide for UNIX*.

- ◆ For important troubleshooting suggestions regarding ServerFree Agent, refer to the Troubleshooting chapter of the *NetBackup ServerFree Agent System Administrator's Guide*.
- ◆ NetBackup for EMC Fastrax messages are logged in the client's `/usr/opensv/netbackup/logs/symlogs` directory (the administrator must create this directory).

Contacting VERITAS Customer Support

Determine whether or not the issue should be reported to EMC

Search the appropriate logs under `/usr/opensv/netbackup/logs/symlogs` for entries that read as follows:

`SYMAPI_message text`

Such entries indicate that the Fastrax unit may be involved. Contact EMC concerning such issues.

If the issue pertains to VERITAS and not to EMC

Before calling VERITAS customer support, please gather as much log information as possible. Be sure to have the following information ready:

- ◆ NetBackup version
- ◆ Operating system version of the NetBackup ServerFree Agent client
- ◆ Note whether or not the action that failed had ever worked, and whether the problem is repeatable
- ◆ Log information

NetBackup for EMC Fastrax Errors

When using robtest, drive does not go to ready state

When a tape is mounted into a Fastrax drive using robtest, the drive status display does not show the drive going to a “ready” state. Fastrax drives cannot be standalone and therefore are not regularly scanned by the Automatic Volume Recognition logic (AVRD).

An unexpected timeout occurred

- ◆ If you receive a status code 23 (socket read failed), or if a restore job finishes with status code 5 (the restore failed to recover the requested files), client timeout periods may need to be increased. This can be done by increasing the `CLIENT_READ_TIMEOUT` and `CLIENT_CONNECT_TIMEOUT` values in the server’s `/usr/opensv/netbackup/bp.conf` file. Although the optimal time-out values for your system may be different, the following values may suffice:

```
CLIENT_READ_TIMEOUT = 3000
CLIENT_CONNECT_TIMEOUT = 3000
```

Increase the timeout values and retry the operation.

In the case of status code 5 during a restore, the safest approach is to increase the timeout values and rerun the restore. Note, however, that the Fastrax system may have completed the restore successfully on its own, even though NetBackup experienced the timeout.

- ◆ If you receive a status code 24 (socket write failed) and the following is included in the bptm log:

```
16:03:45.017 [5750] <16 lbo_wait: put_string: Broken pipe
```

the same client timeout values may need to be increased (see previous bullet).

Fastrax drive is hung in an open state

If a message such as the following appears in a SYMAPI log file in the `/usr/opensv/netbackup/logs/symlogs` directory:

```
FastraxDriveOpen: Exiting - Drive /fastrax/JP74681097 is already
open, stream_state = 2.
```

there may be a “left over” (unused) virtual circuit (VC) from the Symmetrix array through the Fastrax to the tape drive. As a result, the drive may be hung.

To correct the problem, execute the `bpfastrax` command on the NetBackup server:

```
/usr/opensv/netbackup/bin/bpfastrax
```



From the `bpfastrax` menu, select option 2, **Close drive's VC**. When prompted, enter the drive's Fastrax serial number.

For a description of virtual circuits, please refer to your EMC documentation.

SYMINIT failed

If a backup fails with a status code 11, and the NetBackup progress log has a message stating SYMINIT failed (see example log below), a `/usr/symcli` symbolic link must be created that points to the SYMAPI libraries installed on your system.

The following is an example progress log:

```
Backup started Thu 06 Dec 2001 03:53:52 PM CST
15:53:52 Initiating backup
15:54:01 ERR - SYMINIT failed status = -1
EXIT STATUS 11: system call failed
15:54:04 INF - Status = system call failed.
```

EMC releases several different versions of its SYMAPI library (`libsymapi.so`), to support multi-threading, 32-bit and 64-bit machines, and so forth. The library name and install location vary, depending on your configuration.

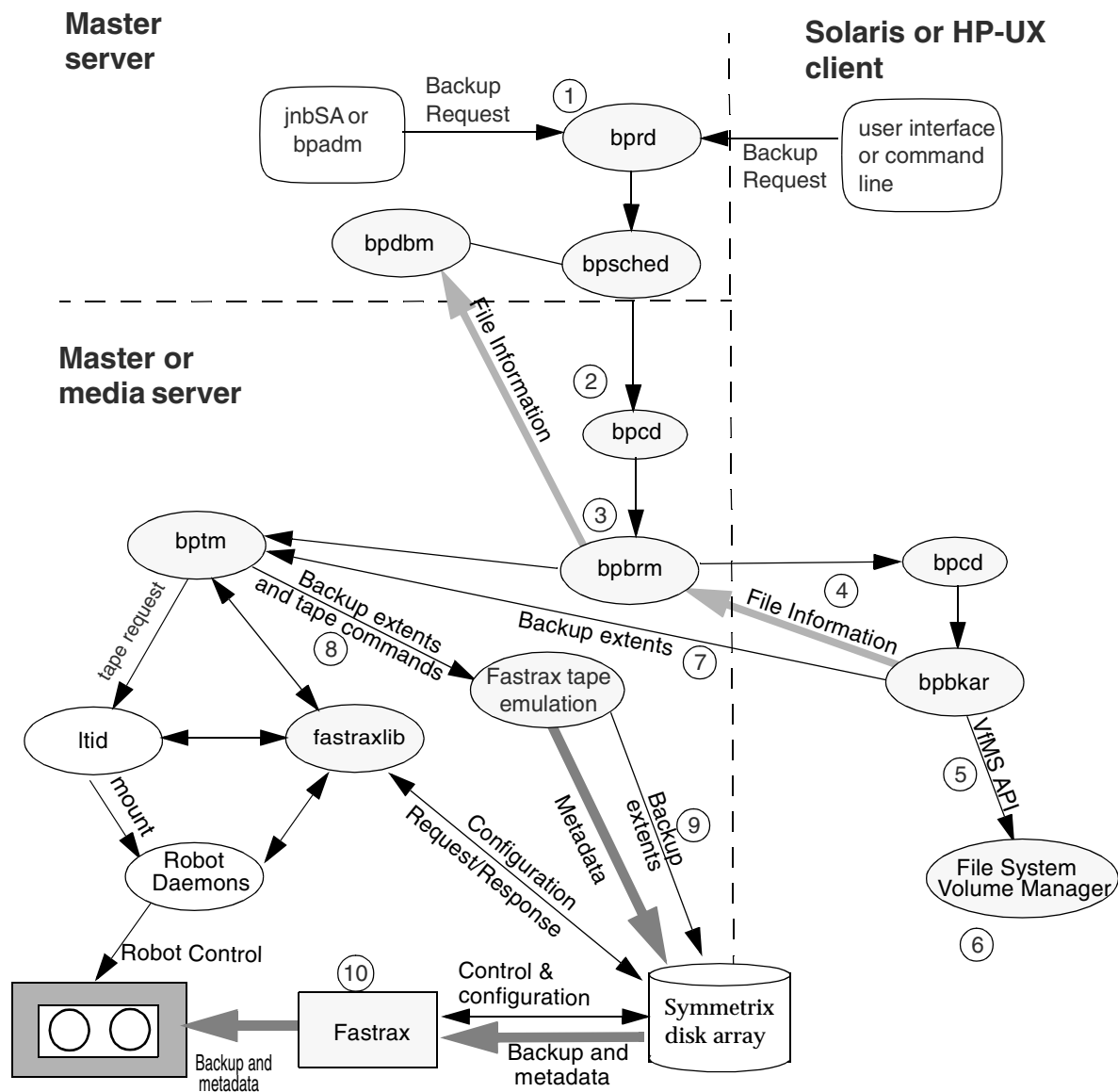
Refer to “Create a Link to the EMC Shared Libraries” on page 12 for more information on this issue.

Backup Process Overview

The following diagram shows the major components for making a backup using NetBackup for EMC Fastrax. Numbers refer to descriptions on the page following the diagram.



NetBackup for EMC Fastrax System Administrator's Guide



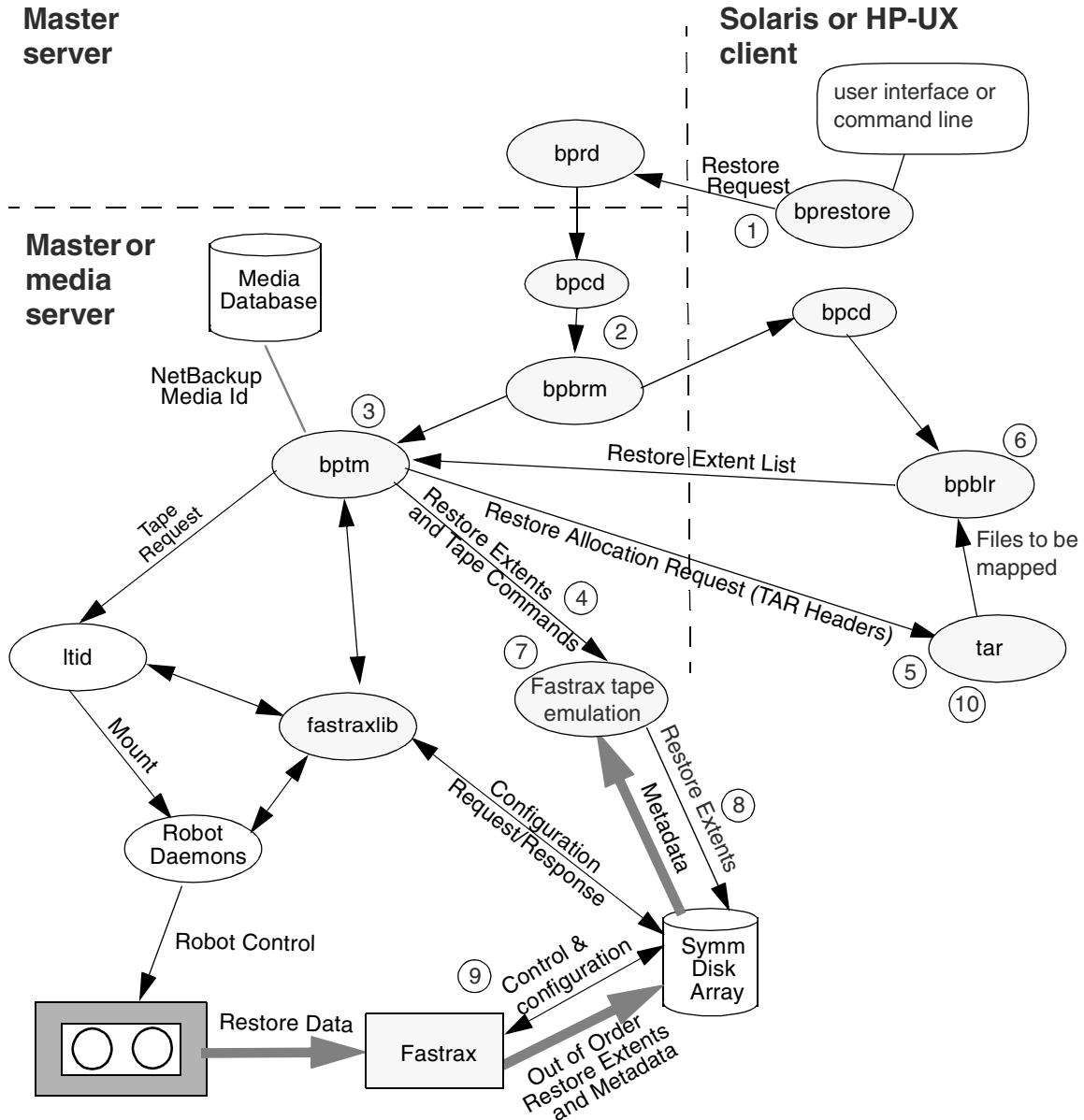
1. The NetBackup master server or client initiates the backup, causing the NetBackup request daemon `bprd` to start the scheduler, `bpsched`. `bpsched` processes the policy configurations depending on the initiator of the backup (scheduled, immediate manual, or user directed). Refer to Appendix A of the *NetBackup Troubleshooting Guide* for more information on this stage of the backup operation.
2. `bpsched` uses `bpcd` (client daemon) to start the backup/restore manager (`bpbrm`) on the media server.
3. `bpbrm` starts the Media Manager process `bptm` and also starts the actual backup by using `bpcd` on the client to start the client's backup and archive program `bpbkcar`. `bptm` verifies that the tape type is Fastrax (not NetBackup or NDMP) and that the volume is mounted on the proper tape drive.
4. `bpbkcar` sends information about files within the image to the backup/restore manager `bpbrm`, which directs the file information to `bpdbm` for the NetBackup file database on the master server.
5. `bpbkcar` requests creation of a frozen image of the client's active data using the VfMS API. `bpbkcar` uses the frozen image method that was configured for the frozen image source.
6. `bpbkcar` requests file/volume mapping information about the client data. `bpbkcar` uses one or more mapping libraries to decompose the client's data into physical disk addresses (also referred to as disk *extents*).
7. `bptm` reads the mapping information (backup extents) from `bpbkcar`.
8. `bptm` forwards the extent list to the Fastrax tape emulation code (part of `bptm`). The tape emulation code formats the extents into SYMAPI commands that are issued to the Fastrax system.
9. The extents are transferred via the SYMAPI interface to the Symmetrix disk array that transfers commands to the Fastrax system.
10. The Fastrax system sends the backup image from the Symmetrix disk array to the tape storage device.



Restore Process Overview

The following diagram shows the major components for making a block-level restore using NetBackup for EMC Fastrax.

Netbackup for EMC Fastrax: Restore Process Overview



1. When the user starts a restore, NetBackup invokes the client's `bprestore` program which sends a request to the request daemon, `bprd`. This request identifies the files and client. The request daemon then uses `bpcd` (client daemon) to start the backup/restore manager (`bpbrm`).
2. If the storage unit on which the files reside attaches to the master server, then `bprd` starts the backup/restore manager on the master server. If the storage unit connects to a media server, `bprd` starts the backup/restore manager on the media server.
3. The backup/restore manager starts the media manager process `bptm` and uses the client daemon (`bpcd`) to establish a connection between the NetBackup `bpblr` program on the client and `bptm` on the server. The `bpblr` program in turn starts the tar program and a connection is also established between tar and `bptm`. The `bptm` process obtains the names of the files to be restored. The file names are then sent to the Fastrax tape emulation code.
4. The fastrax tape emulation code reads a catalog of all files for the requested image and locates the tar headers associated with the files that are to be restored.
5. The tar headers are transferred by `bptm` to the tar program. The tar program creates the files and pre allocates the extents for the files. The files are initially created with a file permission of all zeros to protect the files from being accessed during the restore process. The information about the files is then transferred to `bpblr`.
6. The `bpblr` program maps the new files and creates the extents associated with the file. The extents are then sent back to the `bptm` program.
7. The extents associated with each file are sent to the Fastrax tape emulation logic which formats the extents into SYMAPI commands that are issued to the Fastrax system.
8. The extents are transferred via the SYMAPI interface to the Symmetrix disk array that transfers commands to the Fastrax system.
9. The Fastrax system sends the restore data from the tape device to the Symmetrix disk array.
10. When the restore is complete, a notification for each file is sent from `bptm` to tar which sets the permissions from zero to those that are correct for the file being restored.





The bpfastrax Command

A

This appendix describes the `bpfastrax` command, which starts the `bpfastrax` utility.

The following are special conventions used in the command descriptions.

- ◆ Brackets [] mean that the enclosed command line component is optional. For example, assume that a command has the following format:

```
command [arg1]
```

The user can either choose `arg1` or omit it.

- ◆ A vertical bar (or pipe) symbol | separates optional arguments. For example:

```
command [arg1 | arg2]
```

The user can choose `arg1` or `arg2` (not both), or can omit both.

- ◆ Italics indicate that the information is user supplied. For example, the user supplies a value for *directory* in the following command:

```
-client_libraries directory
```



bpfastrax(1M)

NAME

bpfastrax - start a NetBackup menu interface for NetBackup for EMC Fastrax administrators and users.

SYNOPSIS

```
/usr/opensv/netbackup/bin/bpfastrax
```

DESCRIPTION

The bpfastrax utility has a menu interface. The administrator can use bpfastrax on the NetBackup server to close Fastrax tape drives that are hung in an open state as a result of an error during backup or restore. The user can run bpfastrax on a NetBackup client to rebuild the Symmetrix (SYMAPI) database following any change to that database. (See under “FILES” for the default location of the database.)

See the *NetBackup for EMC Fastrax System Administrator's Guide* for bpfastrax operating instructions.

FILES

```
/usr/opensv/netbackup/db/symdb/symapi_db.bin
```

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